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ABSTRACT

Emphasizing the use of computers to achieve educational objectives, the three essays in this collection utilize the principles of learning, schools of thought in educational psychology, and guidance from a study of the philosophy of education to provide a framework relevant for the use of computers in developing the curriculum. The first essay, "Goals in the Curriculum," assesses the worth of diverse categories of relevant ends in the curriculum, with emphasis on vocational and classical ends and pupil interest as ends. "Computers at the Crossroads" discusses reasons why many classroom teachers do not use available computer technology, the evaluation of software, the philosophy of computer use, the psychology of learning and computer use, and the survival of computer and software use in the classroom. "Computer Use and the Social Studies" discusses the principles of learning and the computer; five kinds of courseware--drill and practice, tutorials, diagnosis and remediation, simulations, and games--and their use in social studies classes; various philosophies of education and the computer, including experimentalism, idealism, realism, and existentialism; and two psychologies of learning, i.e., behaviorism and humanism, and the computer. Eight references are provided for the second essay. (RP)

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COMPUTERS IN THE SCHOOL CURRICULUM
(A Collection of Essays)

by

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GOALS IN THE CURRICULUM

There certainly are numerous goals which individuals may attain in the curriculum. Teachers, principals, and supervisors need to study, analyze, and implement worthwhile objectives for each learner to achieve. The balance of this paper will evaluate the worth of diverse categories of relevant ends in the curriculum.

Vocational Ends

Considerable concern in society is shown for each learner ultimately to achieve well in the world of work. Ideally, each person needs to achieve optimally in providing viable goods and services in society. Workers need to find employment which is personally satisfying and contributes to an improved society. Which vocational objectives then should the curriculum emphasize?

Certainly, learners with teacher guidance need ample opportunities to glean relevant subject matter pertaining to the world of work. Thus, pupils need to understand and appreciate diverse kinds of jobs, occupations and professions in evidence presently, as well as which positions might offer worthwhile possibilities in the future. Careful teacher selection of objectives, activities, and experiences, as well as evaluation techniques in the curriculum may well assist learners ultimately to make better choices in the world of work. Learnings for individuals should be appropriately sequenced to guide each to achieve optimally in the career arena.

Education emphasizing vocational ends believe utilitarian goals are highly significant in the curriculum. What is then learned in the school/class setting can be used in society.

Classical Ends

There are selected educators who believe that subject matter learnings which have stood the test of time need emphasizing in the curriculum. Content which changes in terms of endurance has little use. Educators then need to choose enduring ideas from the classics for pupils to acquire. Classical content may be simplified for the young and increasingly become more complex sequentially.

Vocations in society are in a state of rather continual change. Few are enduring in terms of future worth. Classical content, however, has stood the test of time. Great ideas of such writers as Plato, Aristotle, Kant, Hegel, Descartes, Mill, and James can provide needed stability in the curriculum. A study of enduring ideas in the study of history, grammar, geography, arithmetic, art, and music may also provide for stable content in teaching-learning situations. Learners achieving relevant content from the thinking of great thinkers have a common body of acquired knowledge. Possessing a common body of knowledge, learners are better able to communicate among themselves, as compared to each learner choosing a different set of objectives, as well as selecting diverse learning activities to achieve desired ends.

After a core of enduring ideas from great thinkers has been achieved, the learner may then pursue a selected vocation, profession, or occupation. Utilitarian ends may then be emphasized on the post secondary, or preferably post baccalaureate degree level.

Classical content may well provide guidance for learners in choosing and making choices in the curriculum of life. Classical content is value laden. These values which have stood the test of time may well give direction in making moral decisions in school and in society.

Interests of Pupils as Ends

How significant are the interests of pupils in developing the curriculum? There are selected educators who believe that learner interests should be a major factor in selecting objectives, learning activities, and evaluation procedures. Learner interests may be determined from the following sources:

1. Questionnaire results from pupils.
2. Observation of pupils on the playground and in committees in the school.
3. Comments made about pupils by parents in a conference with the teacher.
4. Input from pupils during teacher/pupil planning sessions.

Educators believing that interests of learners should receive major emphasis in developing objectives, learning activities, and evaluation procedures in the curriculum state, among others, the following reasons for their thinking:

1. Pupils are highly motivated in learning when pursuing their own unique interests.
2. Purpose or reasons for learning increase as interest accrues in ongoing activities and experiences.
3. Perceived subject matter relevance changes rather continuously; thus, individual learners not the teacher, need to select what is relevant to learn within a flexible framework.

Which methods of teaching may be utilized to capitalize on interests of involved pupils?

Learning centers may be used in teaching and learning situations. The teacher may determine the materials and tasks to be located at each center. There are more tasks than anyone pupil can complete. Each pupil may then choose which tasks to pursue and which to omit. Sequence in learning is determined by the involved learner.

Teacher-pupil planning may also be utilized to determine materials and activities at each learning center. Pupils might then increasingly pursue their very own interests and purposes in choosing tasks sequentially.

The teacher may also emphasize heavy input from pupils in determining the curriculum without the utilization of learning centers. For example, to initiate a new unit, the teacher may introduce and show a filmstrip and a set of slides. Content in these audio-visual aids is discussed as the filmstrips and slide presentation progresses. Pupils are encouraged to identify questions and problems. The teacher or pupil may write the questions/problems on the chalkboard as given by learners. A discussion may clarify the meaning of each item. Duplicate or similar questions/problems may then be eliminated. Reference sources to obtain needed answers and information should be discussed with pupils. Pupils may then volunteer which committee to serve on to obtain data relating directly to identified questions and problems. Information obtained by each committee may well be shared with other committees in the school/class setting. Thus, the interests of students are heavily involved in determining objectives, learning activities, and appraisal procedures.

In Conclusion

Which type of curriculum might best provide for individual learners in ongoing units of study? A vocational emphasis places major emphasis upon practical, utilitarian learnings for pupils. The world of work represents ultimate reality for each pupil. A classical curriculum is idea centered. To emphasize classical learnings , pupils need to study ideas of great thinkers which have endured in time and space. Content acquired by pupils represents the the best of ideas developed by outstanding thinkers.

Learner interests need careful consideration in developing the curriculum, according to selected educators. Pupil interests change rather considerably in space and time. To assist learners to achieve adequately in the curriculum, interests of pupils need to be identified and nurtured.

Computers at the Crossroads

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Computers at the Crossroads

Microcomputers are quite common in classrooms around the nation. No doubt, additional computers are needed and desired. However, some kind of access to computer terminals is available to most public school students. One interesting phenomena is the lack of computer and software use in the classroom. Thus, the computers are idle during much of the school day, especially on the elementary school level.

Reasons for Not Using Available Computer Technology

In speaking with many classroom teachers, the writer notices several agreed upon reasons for not utilizing computer service.

First of all, teachers state that software is not available to achieve specific objectives emphasized in the class setting. The software then does not fit in to what is presently being emphasized in the curriculum. Software content does not harmonize with the stated objectives. This is true even if a school system has much software in its library.

Secondly, teachers make little use of a computer in the classroom due to available software not being on

the understanding level of students. To be functional, subject matter contained in the software needs to be meaningful to students. Meaning theory was first emphasized by William Brownell in the 1935 National Society for the Study of Education (NSSE) yearbook entitled Educational Diagnosis.
NSSE at that time strongly advocated that students need to understand what is taught. Otherwise, nonsense learning accrues.

Thirdly, teachers realize that teaching students needs to be highly individualized. A writer of software cannot know what a student needs to learn next, within a highly contextual learning situation. A well trained, professional teacher is in the best position to select what a specific student needs to learn next. A logical curriculum is then in evidence. Humanism, as a psychology of learning, advocates that the learner himself/herself should determine the next order of learning, since it is the student who must do the acquiring of understandings, skills, and attitudes sequentially.

Fourthly, a quality program contains appropriate sequence. Within a software program, students experience each succeeding activity based on the previous experience. Each new step of learning builds confidence within the student. New content presented on the monitor is related to previous ideas presented. A high success rate in learning is then in evidence. To develop well in the affective dimension, a student should feel successful in learning. If software has not been tried out in pilot programs, the steps of needed achievement may be too broad or wide in latitude. A learner may experience considerable failure due to the program having gaps between steps which make sequential learning difficult. The student at the terminal needs to feel that sequential content to be mastered is related. Previously acquired learnings provide readiness for mastery of new subject matter. Teachers may find it difficult to utilize selected software packages due to the poor sequence involved.

Fifthly, teachers find it difficult to manage a classroom of students in which each student may

experience content using software and the computer. They may find it easier to manage a given set of students using other materials in teaching than the use of software and computers. With one computer in a classroom for twenty-five students, the teacher needs to become highly proficient in managing a given set of students. However, the problem of managing students remains with one computer terminal per room. Instead of one computer per room, a separate room could house ten to fifteen computers. Each day of the school year, students with teacher guidance might experience for one class period computer assisted instruction. Students with two members on a team might then work at a terminal. Software utilized by the team must provide for sequential progress in learning.

Sixthly, software and computers must provide for unique ways of learning subject matter and skills which other materials cannot provide. This truly represents a problem for advocates of computer use. How can software programs provide unique ways of learning for students? Many additional materials are available for teachers to utilize as learning opportunities. There

are video tapes, video discs, films, filmstrips, slides, cassette tapes, textbooks, workbooks, worksheets, and library books, among other items of instruction. Computer assisted instruction needs to offer a unique method of teaching which truly assists each student to achieve optimally. New subject matter must be presented on the monitor. The content is sequential from the learner's own unique perceptions. Or, lessons involving review using microcomputers need to be presented. The review presentations must assist learners to master worthwhile subject matter. Problem solving experiences which emphasize reality also need to be in the offing. Finding out where students have specific problems in learning should be another function of computerized instruction. Learning opportunities must then be provided to help students overcome problematic situations in acquiring content. Play as a form of learning is also important. Thus, students need to utilize play methodology to achieve more optimally in using gaming procedures within the framework of computer assisted instruction.

Evaluation of Software

Numerous journals in the field of professional education contain reviews of software evaluation. Selected software programs have been evaluated quite negatively. Enumeration of software weaknesses will now be discussed.

A frequent complaint pertaining to software which has been tried out by students with teacher guidance is that too few opportunities exist for students to interact with the content presented on the monitor. The content presented on the monitor becomes a lecture. Situations such as these avoid relevant goals of software construction. Students should have ample opportunities to respond to questions/test items covering content read on the monitor. A small amount of information then should be presented on the monitor, after which the involved student responds to a related question or test item. Students need to receive feedback pertaining to each response made.

A second criticism of software relates to the prolonged, elaborate feedback that a student receives after responding correctly to a question or test item.

Ten firemen sliding down a pole, as shown on the monitor, after each correct response given by a student is time consuming and monotonous. Rather, the software program should provide clear, concise reinforcement for correct responses made. A brief "that's good" with its many variation phrases for each correct answer given by a student should be adequate in terms of rewards.

Thirdly, carelessness is in evidence when words are misspelled or erroneous information is presented on the monitor. Correct spelling and other mechanics of writing are only to be expected in quality software. Students perceive content on the monitor as a model. Mistakes in the mechanics of writing as well as erroneous information presented on the monitor provide a negative model for students.

Fourthly, weaknesses pertaining to appropriate sequence of content in the software needs remedying. If the steps are too broad in sequence, students experience failure. Certainly, software must be tested in pilot studies prior to being put on the market. Classroom teachers should demand that proper order of content in software is a must. It is only to be

expected that developers of software develop sequential materials for students.

Fifthly, microcomputers and software need to emphasize the concept of being computer friendly. Too frequently, the mechanics of operation become a stumbling block to students. The student needs to spend too much time in determining how to use a specific program that little time is left over for acquiring important understandings (facts, concepts, and generalizations), skills (creative and critical thinking, as well as problem solving), as well as attitudes (beliefs, values, and positive feelings).

Sixthly, excessively difficult terms appear on the monitor. Learners make little progress if the vocabulary load is too great or too complex in an ongoing presentation. Software needs to be appropriately edited so that students experience meaning and not frustration in learning.

Philosophy of Computer Use

Philosophy guides teachers in selecting objectives, learning activities, and appraisal procedures in teaching-learning situations. Each

school or school system needs to develop a philosophy of computer assisted instruction.

Experimentalism, as a philosophy of education, emphasizes a problem solving curriculum. Flexible, not rigid, steps of problem solving need to be emphasized. These steps may well include

(a) identifying and clarifying a problem.

(b) gathering information in answer to the problem.

(c) developing a hypothesis.

(d) checking the hypothesis.

(e) revising the hypothesis if necessary.

The problems must be vital and relevant in society. The school curriculum must be integrated and not separated from society. With student involvement in problem selection, interest in learning should be in evidence. Interest then provides for effort in ongoing lessons and units. With problem solving, subject matter tends to lose its boundaries and borders. The fused, rather than the separated subjects curriculum, is in evidence. What is needed to solve problems and test hypotheses is utilized as subject matter. Experimentalism, as a philosophy of education, has much

to say to the classroom teacher in terms of how computers and software will be utilized. That use will be the solving of problems identified by the student with teacher guidance.

Idealism, as a separate philosophy of education, stresses an idea centered curriculum. One can only receive ideas from the external world. The perceiver cannot know the real world as it truly is or exists. Since ideas then become salient in the curriculum, students need to learn much subject matter. The intellectual facet of a person's development must come first. Software must be selected by the teacher which assists students to attain vital ideas, such as facts, concepts, and generalizations. The broader ideas (concepts, and generalizations), in particular, are significant for learner acquisition. According to idealists, how should software for students be selected? The software content should aid in intellectual growth. Mind is real and needs to be cultivated in mental development activities. Carefully selected software can aid students to attain well in the intellectual dimension.

Realism, as a third philosophy of education, can be emphasized well in the curriculum when using computers. Realism states that one can know the real world as it truly is and exists. One then can secure an objective duplicate of the real world. To attain the real world as it really is, measurably stated objectives for students to achieve need careful selection. To be a measurable objective, precision of the intended end needs to be in the offing. The objectives need arrangement in ascending order of complexity. Observable results are secured from learners if goals have or have not been attained, after instruction. Software using computers should contain only those stimuli which assist stndents to achieve precise objectives.

Realism has much to advocate in computer assisted instruction in that measurably stated results are obtained from students if the precise objectives have or have not been achieved.

Existentialism, as a fourth philosophy, states that students need to develop the art of decision making. Learners need to choose, from among

alternatives, sequential tasks. Tasks chosen, hopefully, will be meaningful, interesting, and purposeful. Students then need to have a voice in determining which software programs to pursue. Teacher-student planning is excellent to utilize as a method of teaching. Existentialists tend to emphasize that knowledge and choices in life are subjective and not objective.

As students grow increasingly toward adulthood, they will find that there are endless choices to make. Life in and of itself is absurd. Within the absurdity of situations, the individual needs to make continuous choices. Moral decisions should be an end result.

Existentialism, as a philosophy of education, also has much to emphasize in software and computer use. The message of existentialism tends to emphasize learners making sequential choices as to objectives, learning opportunities, and appraisal procedures. Value judgments need to be made in computer assisted programs of instruction.

Computers at the Crossroads

The Psychology of Learning and Computer Use

Two psychologies of learning which will be discussed are behaviorism and humanism.

Behaviorism advocates the utilization of precise sequential objectives in teaching students. Software packages should assist students to attain the precise ends. Each objective is observable if students have or have not achieved it, as a result of computerized learning opportunities. Feedback from the computer reveals if a student is successful in achieveng each objective. There is no guesswork if a learner has/has not achieved each precise objective. Linear or branching means of programming are utilized to determine if a student is/is not successful in achieving each objective. Computerized instruction has much to offer in terms of students attaining precise ends.

Humanism, as a second psychology of learning, emphasizes concepts such as student-teacher planning, learning centers or stations, students selecting from among alternatives as to objectives, learning

opportunities, and appraisal procedures. A psychological curriculum is heavily in evidence with rather heavy student input into curriculum development. Whereas, a logical curriculum is stressed when a programmer writes, develops, and tests software for student interaction.

Computers at the Crossroads

Will computers and software survive in the school curriculum? Basically, computers are there in somewhat ample number. Software tends to be lacking in selected curriculum areas. It also lacks quality, relevance, and harmony with child growth and development characteristics. What needs to be done in developing quality software so that computers are heavily utilized in the school curriculum?

Haste has made for waste. Software, in many cases, has not been tested adequately in pilot studies. Errors in spelling and the mechanics of writing are too frequent. Poor models exist for students when seeing problems in spelling and other mechanics of writing on the monitor. Debugging is of utmost importance when

software is placed on the market for school consumption.

More attention will need to be placed on sequence of content in software programs. Sequential learning for students is of utmost importance. Failure to learn can, in many cases, be attributed to improper order of content presented on the monitor. Writers of software must keep the concept of sequence continually in their minds when writing programs for students in different curriculum areas.

Software must fit in to the unit presently being taught in the curriculum. Too frequently, software is not available that relates directly to the lesson being taught presently. Content in software must be integrated into ongoing lessons and units. Separation of subject matter in software with that being taught presently is not acceptable. Neither is it acceptable for software content to be well above or below the present achievement level of the student. If subject matter in the software is too complex, failure in learning will be in evidence. If it is too easy, boredom will tend to set in on the part of the learner.

Computerized instruction must meet criteria of being directly related to subject matter being presently taught in a lesson or unit, as well as be on the understanding level of the involved student.

Relevant content, not trivia, needs to be inherent in software presentations. If a student does not experience what is important and salient in content, time and effort is being wasted by the student. Certainly, content in software needs to be carefully chosen. It must be of value and have practical application in society.

Software use needs to emphasize the concept of being computer friendly. Programs that are too complex for use should be discarded. For example, a program may require the correct spelling of lengthy words into a computer. Otherwise, the commands typed will not be accepted by the computer. Thus, if an item on the monitor requires the student to respond correctly with the word <u>interdependent</u> being spelled correctly, the learner's response may be incorrect due to not spelling that word correctly. The learner may know the correct

answer but not have spelled the word correctly when typing commands into the computer.

Students need to experience a variety of kinds of programs depending upon the needs of the student. Drill and practice, as one kind of program, needs to be in evidence. Review of what has been learned previously is important. Retention of vital subject matter content is a must.

Tutorials, as a second kind of software, must stress new salient facts, concepts, and generalizations for learner acquisition. Unimportant ideas should not be emphasized in quality tutorials. Sequential subject matter must be in the offing to assist students to achieve well when tutorial software is utilized.

A third kind of software emphasizes diagnostic-remedial programs. Diagnosis must pinpoint specific difficulties experienced by a learner. The remediation needs to guide the student to overcome the diagnosed weakness. Remediation must follow diagnosis in the software package.

Simulations should be based on reality and life-like situations. Problems for students to engage

in decision-making is a must in the simulation. True problem solving should be in the offing. Ridiculous situations should be weeded out of any simulation program. As in all software programs, students need to make ample responses to problems and questions. After responding, the learner must receive appropriate feedback, based on each decision made in the simulation. Several students may discuss the pros and cons of each decision made.

Games for students to learn subject matter should be challenging. The games need to stress content that is being taught in ongoing units and lessons. Cooperative choices may be made by a committee when competing against another group. The individual or committee with the highest number of points is the winner of the game.

Software and computerized instruction must meet definite criteria when drill and practice, tutorial, diagnostic-remediation, simulations, as well as games are emphasized in the curriculum.

In Closing

Will software and computer use survive in the curriculum? Presently, many computers stand in classrooms underused and in some cases unused. This media of instruction could go the way of other well advertised technology of the past. However, computers are utilized in the business world and in society in general in a very comprehensive way. School and society must not be separated. Software, to be useful in the curriculum, must be upgraded in terms of quality. There are definite principles of learning which provide guidance in writing software programs. Software content must be evaluated thoroughly prior to its being placed on the market for purchasing by a school or school system.

Diverse philosophies of education and psychologies of learning need emphasis in software development. Perhaps, a specific philosophy and psychology may be developed and become inherent in computer assisted instruction be it drill and practice, tutorial, diagnostic-remediation, simulation, or games.

Above all, computer assisted instruction should provide interesting, meaningful, purposeful, and significant content when providing for individual differences among students.

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Computer Use and the Social Studies

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Running head: Computers in Social Studies

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Computer Use and the Social Studies

Computers are common in the school setting. Too frequently, they are not utilized adequately. The computers are there, but they need to be used optimally in the classroom setting.

In society computers and computer service abound. Computers are common then in all types and kinds of businesses, including supermarkets, banks, and hardware stores, among others. School and society should not be separated. Since computers are fully in evidence in society, students in the school curriculum need to become proficient in utilizing that which is positive, efficient, and beneficial to people. The intent of computer use, as well as its consequences, will assist in determining its positive utilization.

Principles of Learning and the Computer

There are selected principles of learning applicable to computer and software use. These principles have stood the test of time and should be used flexibly in selecting objectives, learning activities, and appraisal procedures. In computer and software use, students need to attach meaning to

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ongoing learning opportunities. If learners experience meaningful activities, they understand what has been learned. Opposite of meaningful content are those experiences not understood and not making sense. Software then needs to be on the present achievement level of the involved student. Based on the present achievment level of the student, new learnings are to be attained by students. The new content must be meaningful and achieveable. Frustration and failure set in if students do not perceive meaning in what is being learned.

Secondly, students need to experience quality sequence in computer and software use. With proper and appropriate sequential learning, success in learning may well be in the offing for the involved student. Success in learning assists in developing an improved self concept. Positive self concepts aid students to improve and to achieve in the social studies. Thus, it is necessary that software components possess sequential steps in learning. If the steps in learning are too far apart within the software components, the student may experience failure. Rather, software must

be tried out in pilot studies to take the weak spots out of its program.

Thirdly, quality software must contain purposeful content. If learnings are purposeful, students perceive values in acquiring the content, skills, and attitudes. Teachers must assist students to perceive purpose in utilizing computers and software programs. To develop purpose within students inductively, the teacher may ask selected questions covering content in the software to guide learners intrinsically to understand reasons for participation in and interacting with the computer program(s). To stress deduction, the teacher may clearly and concisely explain to learners values of the software program to be utilized. If students perceive purpose in learning, an increased desire to attain and to achieve should be in evidence.

Interest in learning is important. Software use should capture learner interest. If students perceive interest in learning, effort is involved in achieving objectives in the social studies. Too frequently, the student lacks interest in the ongoing learning opportunity, thus achievement is at a rather low level.

Rather interest and effort need to become one and not dual in nature. With a high degree of interest in the software program, the student should apply continuous effort in learning.

Motivation is important in achieving vital ends in computerized instruction. With proper motivation, the learner has an increased energy level for learning. Stimuli from the software content then provides for a higher level of motivation. An eager learner desires to achieve and is motivated to attain definite objectives.

Balance among objectives is significant in emphasizing software and computer instruction. Generally cognitive (intellectual domain) objectives are stressed. This emphasis needs to be balanced with affective and psychomotor goals. Affective objectives stress a love for learning. Life itself consists of continuous, sequential learning. Psychomotor objectives reflect the use of the large and fine muscles. Learning opportunities can be developed, psychomotor in nature, which correlate with the software presentation. These activities may include

construction experiences, model making, pantomimes, creative dramatics, as well as art tasks. Cognitive objectives should stress critical and creative thinking, problem solving as well as making inferences and predictions.

To summarize guidelines to be utilized in using software and computers, students need to experience meaningful learnings, sequential activities, purposeful tasks, interest in lessons, motivation and stimulation, as well as balance among objectives.

Kinds of Software Programs

Software selected for students in the social studies depends upon the purpose involved. Goals are to be achieved by students when using computers in the curriculum. Software programs should not be utilized for the sake of doing so, but rather definite reasons are inherent for the utilization of a specific learning opportunity.

Selected students may need to experience software emphasizing drill and practice. There are definite knowledge items important to learn, and yet these students have not done so and need drill and practice

learning opportunities. Software emphasizing drill and practice in the social studies must stress that which is salient and important. The software should also emphasize subject matter necessary to be learned in the social studies unit being taught. The drill and practice opportunities need to capture student interests. Being interested in the content will assist learners to master the needed subject matter. Drill and practice experiences have frequently been boring to learners. Routine procedures of subject matter accquisition have been utilized. Software and computer use provide another media for students to learn through drill and practice.

Drill and practice activities should be sequential to the students own unique perception. Students need to interact very frequently to content presented on the monitor. A oneway street of communication in lecture form from what is on the monitor to the student is to be frowned upon. Rather, the learner must make frequent responses to answers wanted to questions presented on the monitor. Learners need to receive frequent feedback from responses made. Thus, for each

question presented, the student makes a response. Based on the response, feedback is provided on the monitor to let the learner know of the adequacy of his/her response. If a correct response was made, a reward should be presented on the screen. Excessive time should not be given to show the reward. Rather, the reward clearly shows the involved student the correctness of the response made. Incorrect responses are remediated.

A second type of software stresses tutorial experiences for students in social studies. Tutorial software emphasizes new subject matter for student attainment. New content must be related to previously developed facts, concepts, and generalizations. Tutorials then need to emphasize proper order of experiences for students. Learners need to interact frequently to questions related to content presentation in the tutorial. Active participation, not passive recipients, is important in tutorials. These programs provide opportunities for optimal growth. Debugging of software is a must. Thus, the content contains no spelling, punctuation, and capitalization errors.

Adequate pilot studies of the software have taken out the inherent weaknesses. The subject matter is sequential. With successful experiences, students may develop quality attitudes. Related learning to the software tutorial can emphasize psychomotor learnings, such as creative art endeavors. New subject matter is to be learned by the student in the tutorial, and the learner is motivated toward achieving definite objectives.

A third type of software in the social studies stresses diagnosis and remediation. To diagnose, specific errors are pointed out on the monitor pertaining to objectives being emphasized. After diagnosis, a program on a disc provides for remediation endeavors. Diagnosis could emphasize at which point a student cannot locate an entry in an encyclopedia or dictionary. Remediation would emphasize tasks, sequential, to take care of the difficulties.

Software with a diagnostic remediation emphasis must truly pinpoint learner difficulty. Very precisely, the problematic error must be located. Equally salient is that the remediation endeavors

assist the learner in taking care of the problem area. A direct relationship must exist between the diagnosis and the remedial concepts.

Too frequently, software has not been effective in identifying specific problems in learning faced by a student. A further problem exists when the remediation work stressed in the software fails to do its specific task. Quality software identifies and remediates problematic situations.

A fourth kind of software in social studies stresses simulations. A simulation emphasizes role playing. A real life-like series of situations are presented. Problem solving is in emphasis in that students make sequential choices from dilemma situations presented on the monitor. For each choice made, the student receives feedback, prior to the next decision to be made.

Simulations should not present artificial situations for students. The programmer must develop reality into the software program. Low risk decision-making is involved to the learner. Thus, a student does not personally experience the negative

when responses are made. In life itself, incorrect decisions can be quite defeating to the chooser. The consequences of a choice can indeed be harmful to the student in the actual, societal arena. In simulations, the situations are reality based and as much as possible society based; however, the consequences of each decision is unreal in terms of negative choices made from among alternatives presented on the monitor or screen. The student is then shielded from the harsh realities of life.

Simulations place high value on students learning to make choices and decisions. The choices and decisions are based on reality and realness, rather than the fanciful and the absurd. Feedback is provided to each student based on the command typed into the computer. The learner can then judge the adequacy of his/her response. Problem solving is in evidence when a decision needs to be made based on alternatives. Several students can be involved in a simulation learning opportunity.

A fifth kind of software stresses the playing of games. Several students will be involved in the

playing of a game. Each attempts to be the winner. Thus, a student may select, from among alternatives, whether to play for five, ten, fifteen, or twenty points in attempting to answer a question pertaining to social studies. The lower the point value, the easier it is to answer that question. The student then may play it safer by attempting to answer an easier question. Or, more risk may be stressed by attempting to answer a question correctly with each having a higher point value, including twenty points received for answering a single question correctly. At the end of the game, the student with the highest total score is the winner of the game.

Games tend to motivate students to achieve. Play has long been advocated as an important means of learning. Games emphasize the play concept. Since play is enjoyable to students, it can be a significant vehicle to encourage learner progress and achievement. Software game development must emphasize student interest. Interest in an activity makes for effort. Each student needs to be challenged to attain optimally in games. The games help students to achieve definite

objectives. Much learning of facts, concepts, and generalizations can come from gaming software. The games, if possible, should relate to ongoing lessons and units in the social studies.

Philosophy of Education and the Computer

There are definite philosophies, different from each other, which may well be utilized with software and computers. One philosophy, namely experimentalism, stresses that students identify and solve life-like problems in the environment. The problems need to come from society. School and society should be integrated, not separated from each other.

Flexible steps are involved in emphasizing problem solving in the classroom. First of all, a problem needs identification and selection. The problem must be clearly stated. A variety of learning opportunities need to be provided so that learners are stimulated to select a problem. Next, data or information needs gathering in answer to the problem. Computer databases can assist in securing the needed contents. A hypothesis is then developed. The hypothesis is tentative, not absolute, and is subject to testing.

Computers in Social Studies

What is to be learned has utilitarian values in the social studies. Databases and computer use provide solutions to problems which are life-like in the societal arena. Subject matter is not learned for its own sake, but it is used in problem solving situations. Simulations work well in decision-making situations involving the solving of problems.

Simulations emphasize reality with reduced levels of personal risk taking. Vicarious experiences are then involved for students. Experimentalism likes to go one step further in emphasizing the identification and solutions of real problems existing in the societal arena.

Idealism, as a second philosophy, stresses an idea centered social studies curriculum. Vital subject matter may well be learned for its own sake. When using quality tutorials, vital facts, concepts, and generalizaitons can be acquired by learners. The major objective in idealism, as a philosophy of education, is to assist students to achieve content. In addition to software assisting learners to secure worthwhile subject matter, textbooks, workbooks, worksheets, and

selected audio-visual materials provide worthwhile experiences for students. The learning of subject matter can guide students in the future to become good citizens in society. Education is preparation for life, that is to interact with others in society.

The teacher as an idealist is well qualified and prepared to teach subject matter. This teacher needs to be highly knowledgeable of software which will assist students to achieve important facts, concepts, and generalizations. The intellectual facet of a student's development must receive primary emphasis in teaching and learning. Thus, the mind or mental development needs to receive primary stress in guiding students to achieve objectives. Mind is real and needs stimuation through a variety of worthwhile learning activities stressing an idea centered curriculum.

Idealism emphasizes definite ideals or moral standards for all students. Immanuel Kart (1724-1804), a leading idealist, advocated the Categorical Imperative for learner acquisition. The Categorical Imperative stated that people should be treated as end and not as means to an end. The means to an end would

stress using individuals as stepping stones to achieve objectives. The Categorical Imperative is similar to the Golden Rule -- "Do unto others as you would have others do unto you."

From software and computer instruction, students may acquire vital ideas. A subject centered curriculum is then in evidence. Tutorials, as a type of software, would especially be relevant in presenting content sequentially to learners.

Realism, as a third philosophy of education, advocates that one can know the real world and reality as it truly is, in whole or in part. A blue print or duplicate of the natural and social environment is then received. Since the real world can be known, in whole or in part, specifics or measurably stated objectives can be emphasized in the social studies. With precise ends, the learner has either been or not been successful in goal attainment. Diverse types of software programs offer students opportunities to achieve measurably stated objectives. Relevant objectives need to be in the offing. Thus, drill and practice, tutorials, diagnostic and remediation,

simulations, and games stress specific goals. When responding, for example, to a drill and practice item, a learner is either right or wrong. Feedback to the learner is provided for each response he/she has made. At the end of a program, the student knows what per cent of the total items he/she responded correctly to.

Objectivity is important to a realist. In scoring results to test items in a software program, there are no subjective evaluations. The student responds correctly or incorrectly to sequential test items covering content read on the monitor. Thus, there is an objective world, outside the framework of the observer. This objective, outside world needs to be known in whole or in part by the student as he/she attains sequential objectives.

Existentialism emphasizes decision-making by students in terms of objectives, learning opportunites, and appraisal procedures. To make choices is to be human. Permitting others to make decisions for the self demeans the latter. Software and computers can provide learners with opporunities to make choices. Simulations emphasize the making of decisions from

among alternatives. Which decisions to make in a simulation are the perogative of the student. There could also be decisions made as to which simulations to pursue sequentially and which to omit.

A learning centers philosophy may harmonize well with existentialism as a philsophy of education. The student may then select which kinds of software to pursue pertaining to an ongoing social studies unit. Adequate software packages need to be available for sequential choices. Students need to select those learning opportunities which stress perceived purpose interest, and meaning. Other kinds of teaching materials may also provide activities as experiences at the diverse learning centers in the classroom setting. These include reading and audio-visual aid activities.

To advocate existentialism in the social studies, the individual learner chooses whether to work by the self or with others in a committee setting. Knowledge is subjective, not objective, to the decision-maker. Each social science discipline may provide content in the social studies which stresses the subjective in terms of knowledge, values, and beliefs. Ultimately in

life, the decision-maker can make choices, among alternatives, which are truly awe inspiring.

Microcomputer Use and the Psychology of Learning

Behaviorism, as a psychology of learning, advocates the utilization of behaviorally stated objectives. These objectives are arranged in ascending order of complexity. The teacher selects learning opportunities for students to attain the ordered objectives. Only those stimuli stressed in the objective should be contained in the learning activity or experience. After instruction, the teacher can measure if a learner has or has not been successful in goal attainment. If the objective has been achieved, the student is ready to attain the next sequential end. Students may do their own pacing to achieve optimally within the framework of sequentially stated objectives. If a learner does not achieve an end, a different teaching strategy needs to be in the offing. Measurably stated objectives and observable results are wanted from students after the learning opportunity has been implemented. Drill and practice, tutorial, diagnostic and remedial software, in particular,

emphasizes the thinking of behaviorists when emphasizing a specific teaching strategy.

Humanism, as a psychology of learning, emphasizes concepts, such as student-teacher planning, student decision-making, as well as an open curriculum. Students with teacher guidance might then select software packages which meet the formers own personal needs, interests, and purposes. Goals reside within the learner in choosing sequentially what to learn, according to humanism. A psychological curriculum is then in evidence. In comparison, behaviorism stresses a logical curriculum in that the teacher sequences objectives for students to attain.

In Summary

The classroom teacher must emphasize definite principles of learning when software and computers are utilized in the curriculum. These principles of learning when implemented in teaching-learning situations assist students to achieve more optimally in the social studies.

Computers in Social Studies

Diverse kinds of software programs need to be utilized in ongoing lessons and units. Drill and practice, tutorial, diagnosis and remediation, simulations, and games are different from each other in terms of objectives stressed. The kind of software selected for student use must reflect definite goals in the social studies.

Philosophy of education has much to say as to how software and microcomputers will be utilized in the classroom. Diverse philosophies such as experimentalism, idealism, realism, and existentialism may be utilized wisely in the classroom setting. An eclectic philosophy may be an end result.

Classroom teachers need to be clear on behaviorism and humanism as psychologies of learning. Psychologies used must help students to achieve optimally.